Preventing Childhood Lead Poisoning in Manchester, New Hampshire

Recommendations for the Community

Manchester Health Department

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Abbreviations Used Within This Document

BLL:	Blood Lead Level
CDC:	Centers for Disease Control and Prevention
GMPALP:	Greater Manchester Partners against Lead Poisoning
HHS:	Healthy Home Services
HITS:	High Intensity Targeted Screening
MHD:	Manchester Health Department
MMWR:	Morbidity and Mortality Weekly Report
NH CLPPP:	New Hampshire Childhood Lead Poisoning Prevention Program
NH DHHS:	New Hampshire Department of Health and Human Services
TWH:	The Way Home
WIC:	Women, Infants and Children Program

This report is dedicated to Dr. Selma Deitch and Dr. William Straughn, who have worked tirelessly throughout their careers to actualize healthier lives for Manchester children.

We thank you.

Executive Summary

Lead poisoning remains the nation's most prevalent, **preventable** childhood health problem. Each year in the City of Manchester as many as 125 children may be identified with elevated blood lead levels. Although major achievements have been made in the elimination of childhood lead poisoning, Manchester children continue to be exposed to this toxin at unacceptable levels.

Lead is a naturally occurring element and its use dates far back in antiquity. Lead is highly toxic and can affect many systems and organs throughout the body. Young children and fetuses are most vulnerable to lead poisoning, as lead is particularly harmful to the developing brain and nervous system. Blood lead levels once considered to be safe are now associated with deficits in intelligence.

Consistent with the core public health functions of assessment, policy development and assurance, the City of Manchester and partnering agencies have a long history of leadership in the battle against lead poisoning. Environmental interventions, education, community collaboration and case management are key strategies, which continue to be employed. However, it is sobering to conclude that despite numerous public health achievements within the past century, children continue to be exposed to lead. The recent death of a Manchester child from lead poisoning, coupled with the number of children who continue to be identified with elevated blood lead levels reiterates the need for united and concerted endeavors to promote the primary prevention of lead poisoning.

Model programs identified within other communities cite approaches, which have been successful in preventing and managing lead poisoning. Strategies include **case management, door-to-door lead screenings, screenings at WIC Programs, physician outreach, partnership and capacity building, community and in-home education, and primary prevention efforts made possible through HUD funding.**

Childhood lead poisoning as a public health measure, serves as one indicator of the community's total health. In 1998, the NH Department of Health and Human Services declared the City of Manchester a high-risk community for lead poisoning. The determinants and risk factors include the following, which are specific to Manchester

- The City of Manchester has an abundance of **old housing stock**, with 80% of the dwellings in six center city tracts being built prior to 1940.
- Manchester children are almost twice as likely to live in **poverty** than children in the State of New Hampshire.
- The current **housing shortage** has exacerbated the challenges in securing affordable, lead-safe housing for families.
- **Lead screening rates continue to be low**. In 2000, only 63.23% of one-year-old children and 32.39% of two-year-old children received lead screenings.
- Since 1996, 242 Manchester children were identified with **elevated blood lead levels $\geq$ 15 ug/dl** and received case management services.
- In 2000, 11.0% of the 1,571 children participating in Manchester WIC Clinics were classified as having **iron deficiency**, placing them at increased risk for lead absorption.
- Recent **racial/ethnic shifts** within the community have impacted the ability of families to access the **health care system**. From 1996-2000, 1,721 new refugee arrivals have resettled within the community. According to the 2000 Census Data, Hispanic Americans represent 4.6% of the population.

Healthy Manchester 2010 Objectives

- To achieve the goal of the elimination of childhood lead poisoning by 2010, one and two-year-old Manchester children will received universal blood lead screening by 2005.

  Baseline: In 2000, 63.23% of one-year old children and 32.39% of two-year-old children Manchester children received screenings.

  Target: 100%

- Eliminated elevated blood lead levels ($\geq$ 10 ug/dl) in all children.

  Baseline: 1.75% (12%) of Manchester children aged 1 to 5 years of age were newly identified with blood lead levels exceeding 10 ug/dl during 2000.

  Target: Zero

- Increase the proportion of occupied rental units, which meet COC requirements.

  Baseline: Baseline Not Available

  Target: 100%

The Greater Manchester Partners against Lead Poisoning commenced work on the development of a community action plan in 2001. Through the work of a committed Steering Committee, the group identified a number of issues impacting on lead poisoning within the community. In summary, the community recommendations to prevent and manage lead poisoning include:

- **Education:** Implement educational programs for adults, children and health care providers with specific outcome measurements to promote the primary prevention of lead poisoning.
- **Screening:** Increase screening for at-risk children through facilitating access to "medical homes", door-to-door initiatives, linkages at WIC Clinics and broad-based educational campaigns to reach families and health care providers.
- **Lead-Safe Housing Stock:** Partner with State and local agencies to assure access to lead-safe housing through HUD grants which promote primary prevention efforts, timely environmental investigations, code enforcement, tax incentives and low interest or no interest loans for property owners.
- **Community Support:** Augment partnerships with the Greater Manchester Partners against Lead Poisoning, the Healthy Manchester Leadership Council, the Manchester Immunization Group for Healthy Tots and Youth, the NH CLPPP, health care providers and community based agencies to promote lead poisoning prevention.

Introduction

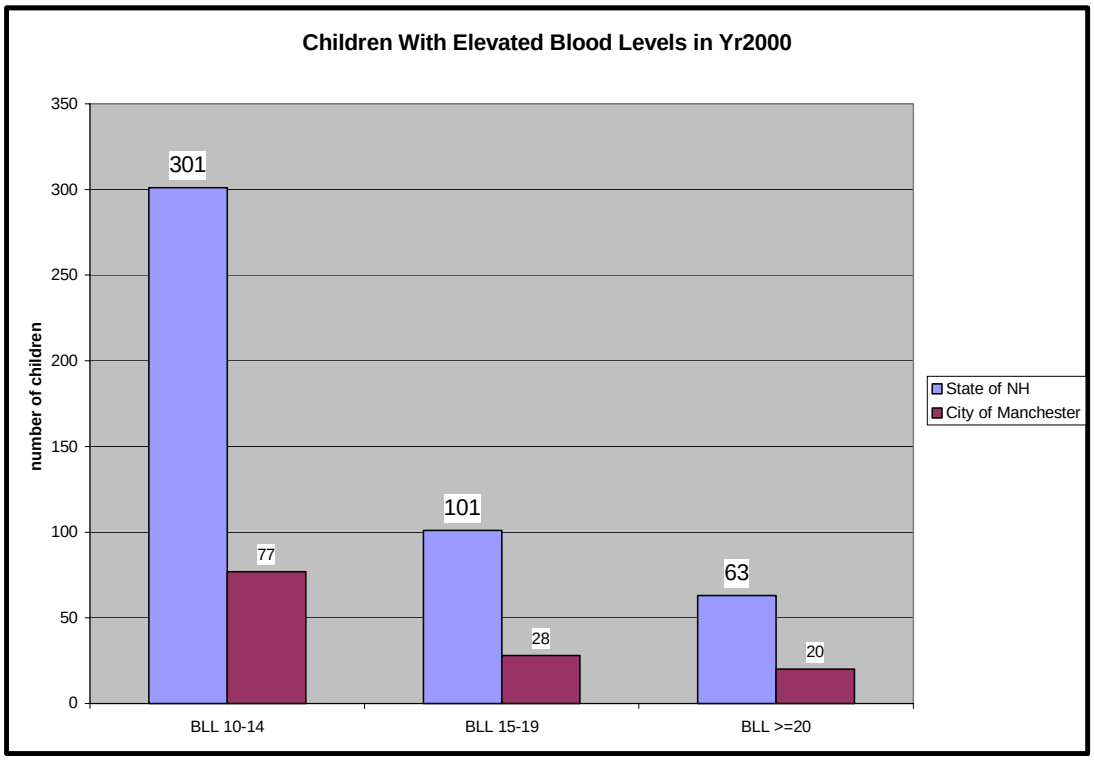
"*Lead levels far lower than those once considered toxic can affect IQ,, school performance, and behavior*"

-Herbert Needleman, MD

Defining Lead Poisoning

Lead poisoning remains the nation's most prevalent, preventable childhood health problem. Each year in the City of Manchester as many as 125 children may be identified with elevated blood lead levels. The threat of childhood lead poisoning is one shared with communities across the State of New Hampshire; however, Manchester is disproportionately impacted by this preventable environmental health problem. Although major achievements have been made in the elimination of childhood lead poisoning, Manchester children continue to be exposed to this toxin at unacceptable levels. In order to assess lead poisoning within the community, there must be the fundamental comprehension that childhood lead poisoning as a public health measure, serves as one indicator of the community's total health.

At the beginning of the twentieth century, deaths from lead poisoning were common. Now one hundred years later, fatalities from pediatric lead poisoning are rare. However, the first reported death of a child from lead poisoning since 1990 occurred in the City of Manchester in 2000. A two- year- old Manchester child succumbed to complications from lead poisoning with a blood lead level of 391 ug/dl (micrograms of lead per deciliter of blood). The subsequent investigation implicated lead paint and dust in the home as the most likely source of the poisoning (source: MMWR, June 08, 2001).



The aforementioned death and the number of Manchester children who continue to be identified with elevated blood lead levels underscores the need for heightened awareness and response in the continuing battle against lead poisoning.

Lead is a naturally occurring element and its use dates far back in antiquity. Lead is ubiquitous within the environment, with no known physiologic value. For many years, government agencies, elected officials and private citizens sought guidance as to what constitutes a harmful level of lead in the blood and how one should define lead poisoning. Although it is not possible to select a single number to define lead poisoning, epidemiological studies have identified harmful effects of lead in children at blood lead levels as low as 10 ug/dl (Centers for Disease Control and Prevention {CDC}, 1991). Recent studies have demonstrated inverse associations between blood lead concentration and deficits in cognitive functioning in children at levels as low as 5 ug/dl (Public Health Reports, 2000). Low body weight, iron deficiency anemia and poor nutrition all predispose young children to lead poisoning. In addition, living in poverty, which at times forces families to reside in substandard housing, is another key factor when evaluating risks for lead exposure.

As lead poisoning is entirely preventable, the CDC believes it can be eliminated as a public health threat within ten years. The actions required to make lead poisoning a disease of the past include the following:

- The enhancement of preventive strategies with an emphasis on primary prevention (preventing lead poisoning prior to children ingesting lead)
- Broad-based screening measures to identify children at risk
- Professional and public education campaigns
- Eliminating lead from homes occupied by children
- A "shared responsibility" among community stakeholders including health care providers, consumers, public health and the private sector

This document summarizes the scope of the lead problem within the City of Manchester and provides specific recommendations for the community in terms of addressing and eliminating childhood lead poisoning.

Lead Poisoning Prevention: The Historical Perspective

Since Egyptian times, lead has been used as a therapeutic agent. Lead compounds were used medicinally on the European continents since the 16th century and were later employed on the North American continent. It has been documented that lead was utilized in decorative items, cosmetics, cooking utensils and the winemaking process as well as being widely used during the Roman period for technological developments.

Childhood lead poisoning was first recognized as a separate entity at the turn of the 20th century. Australian physicians provided the earliest reports of childhood lead poisoning. The source of lead poisoning remained mysterious until 1904, when it was suggested that lead paint was the source of poisoning. In the United States, the initial reports of childhood lead poisoning were published during the second decade of the 20th century. In the 1930's, the Baltimore Health Department played a key role in the development of the first extensive public health program to prevent childhood lead poisoning (Source: Pueschel, Linakis and Anderson, 1996).

Prior to 1950, most paint contained lead as a pigment base. Before this time, the most common paint was pure white lead mixed with just enough linseed oil to make it spread. Often, the resultant paint was 50% lead or higher. By the late 1940's and early 1950's, the paint industry voluntarily began to replace lead with titanium dioxide, primarily because this compound was less costly than lead (Source: Manchester Health Department).

During the 1960's, lead poisoning was increasingly recognized as a significant pediatric public health problem. Many communities began to implement screening programs during the 1960's, 1970's and 1980's. Whereas many other countries had enacted legislation with regard to lead poisoning prevention in the infancy of the 20th century, it was not until the late 1960's that the United States introduced

legislation to provide federal assistance to local governments for projects involving the detection and treatment of lead poisoning in children. Significant changes have taken place since the 1960's with respect to blood lead levels. In the early 1960's, it was assumed that the upper "normal" blood lead level in children was 60 ug/dl. In the mid-1960's it was suggested that the upper normal limit should be lowered to 40 ug/dl, which was finally accomplished in 1970. In 1975, the CDC reduced the upper limit of blood lead levels to 30 ug/dl, and ten years later, to 25 ug/dl. In 1991, the level was further reduced to 10 ug/dl (Pueschel, Linakis and Anderson, 1996).

During the 1970's, lead was removed from paint by federal order. In addition, lead in the air declined markedly as its use as a gasoline additive was substantially reduced. During the 1970's, various preventive initiatives were employed within the City of Manchester. The following summarizes the local historical milestones from 1976 to the present.

1976 A system was established whereby the results of all blood lead analyses performed at the State Laboratories were reported to the Manchester Health Department.

1977 The Manchester Health Department (MHD) published the *Estimation of the Extent and Nature of Lead-Paint Poisoning in Manchester, NH*. The report cites that from 1975-1977, 56 children with elevated blood lead levels of at least 40 ug/dl were reported. The report also estimated the number of elevated blood lead levels in children under the age of six from Manchester's twenty-six Census Tracts was between 465 and 521. It was determined that of Manchester's 30,070 housing units (1970 data), 67.2% or 20,333 units were built prior to 1940. When the environmental investigation revealed that lead paint was accessible to children, a letter was sent to the property owner urging that proper measures be implemented to prevent the future occurrence of lead poisonings.

1977 Grant funding was sought to increase lead screening efforts and establish a Division of Lead Poisoning Prevention at the MHD.

1977 Senate Bill 320 promoted the establishment of a statewide program to prevent lead poisoning.

1978 Lead poisoning specialists from the Centers for Disease Control worked with MHD staff to implement a lead screening clinic to identify youngsters with elevated blood lead levels and estimate the extent of childhood lead poisoning within the community.

1980 House Bill 788 was passed adopting federal standards to prohibit the use of lead-based substances in dwellings.

1987 Lead was removed from plumbing solder.

1989 Health Department sanitarians collected 672 samples from bubblers and water coolers in 25 Manchester schools. Testing was performed by laboratory personnel at the Manchester Water Works using EPA-approved methodologies. Of the 672 samples collected, 138 (20%) exceeded the 20 ppb (parts per billion) lead level recommended by EPA. The MHD put forth recommendations that water coolers and bubblers with levels over 20 ppb should be resampled and put out of service until lead levels are reduced to below 20 ppb.

1989 The City of Manchester amended its Code of Ordinances to include the provisions of NH RSA-130-A, relative to lead poisoning prevention and control. If a child is determined to have an elevated blood lead level >= 20 ug/dl, the MHD will conduct environmental investigations, issue abatement orders, and enforce such orders. These activities continued through June 30, 1992 through the use of City funds.

1992 In July, the State of New Hampshire Childhood Lead Poisoning Prevention Program (NH CLPPP) received funding from the CDC to address childhood lead poisoning prevention throughout the State. NH CLPPP contracted with the MHD to perform environmental investigations, issue abatement orders, and enforce the orders.

1992 Following the changes in the federal definition of childhood lead poisoning, the State of New Hampshire reported an increase in lead poisoning cases from 96 in Fiscal Year 1991 to more than 700 in Fiscal Year 1992. The State of NH sought additional funding of $245,600.00 to enhance lead poisoning

prevention efforts. The additional funding would permit the State to designate a chief of the lead poisoning prevention program and hire a nurse and an environmentalist.

1992 The MHD received funding from the State of NH to hire a Public Health Specialist responsible for conducting lead poisoning prevention activities over a five-year period.

1993 The MHD hired a part-time (24 hours per week) Community Health Nurse to provide lead case management services.

1994 Funding from the NH Department of Health and Human Services provided for an additional Community Health Nurse to provide lead screenings at WIC (Women, Infants and Children) Clinics.

1995 The Manchester Health Department published a report on the cost-effectiveness of case management in the *Journal of Environmental Health.*

1995 The current RSA 130-A was passed, which provides authority for the State of NH to implement a training, licensure, and regulatory program. The legislation also required the State to conduct surveillance of childhood lead poisoning, provide case management services to children with confirmed elevated blood lead >= 15 ug/dl and collaborate with local public health departments, property owners, health care providers and others to provide prevention programs.

1996-1997 Additional funding allowed for the expansion of case management services from 24 to 40 hours per week at the MHD.

1997 NH CLPPP no longer provided funding for the MHD to conduct environmental investigations and enforcement activities. By State authority, the NH CLPPP assumed the responsibility for these activities in Manchester. It was determined that until the City Ordinance is repealed, the NH CLPPP will conduct inspections, the MHD will issue the abatement order, and the NH CLPPP will assume responsibility for enforcement of said orders. On July 28, 1997 the repeal of Chapter 12 of the City of Manchester Code of Ordinances began. The final reading and incorporation of revised Chapter into Code of Ordinances occurred on October 7, 1997.

1997-1998 Funding for lead screenings at Manchester WIC Clinics ceased.

2001 Funding for case management services at the Manchester Health Department was reduced. As of July 1, 2001, the nurse case manager was funded to provide 24 hours per week of case management services again.

March 2002 the MHD began the provision of lead screenings one-day per week at WIC Clinics.

The Effects of Lead on Children and Fetuses

Lead is highly toxic and can affect many systems and organs throughout the body. Young children and fetuses are most vulnerable to lead poisoning, as lead is particularly harmful to the developing brain and nervous system. One and two-year-old children are at greatest risk for lead exposure due to the following factors:

- The presence of normal hand to mouth activity which introduces nonfood items into their gastrointestinal tracts
- Increased mobility which allows increased access to lead exposure
- Young children tend to absorb more lead
- The developing body systems and brain of youngsters are more vulnerable to the harmful effects of lead

Coma, seizures and death may be related to very high levels of lead (blood lead levels $\geq$ 80 ug/dl). At lower levels, lead may cause adverse effects on the kidneys and circulatory system and can damage the central nervous system, resulting in reading and learning disabilities, hyperactivity, cognitive impairment, and behavioral problems. Recent studies have concluded that for every 1 ug/dl increase in blood lead

concentration, there was a 0.7 point decrement in mean arithmetic scores, an approximately 1 point decrement in mean reading scores, a 0.1 point decrement in mean scores on a measure of nonverbal reasoning and a 0.5 decrement in mean scores on a measure of short-term memory. An inverse relationship between blood lead concentration and arithmetic and reading scores was observed for children with blood lead concentrations lower than 5.0 ug/dl (Public Health Reports, 2000).

A recent study suggests that blood lead levels are associated with dental caries in the United States population. Although further studies are needed to substantiate the causal association between lead exposure and dental caries, data indicates that the approximately 2.7 million cases of dental caries in older children and adolescents may be related to lead exposure within the environment or a factor that is directly related to environmental lead exposure (Source: The Journal of the American Medical Association, June 23.30, 1999).

The Environmental Health Center at Cincinnati Children's Hospital Medical Center, in collaboration with the University of Cincinnati researchers conducted a recent study which tracked children over a period of time. The study concluded that exposure to lead in childhood could lead to antisocial or even criminal behavior in adults. Both prenatal and postnatal exposure to lead were associated with antisocial behavior in children and adolescents.

A new theory has been promulgated by the University of Rochester linking childhood lead exposure to osteoporosis. Scientists have reported that exposure to lead interferes with bone formation and increases the risk of osteoporosis later in life. If confirmed, the theory will have significant implications for women in the "baby boom" generation that may have been exposed to lead in the 1950's and 1960's. The theory indicates that as women reach menopause, lead which has been stored in the bones for decades is released. The lead may accelerate the decline in bone density and increase the risk of fractures. Researchers at the University of Rochester have based their theory on a decade of research at the cellular level and in animals. As a component of the research, Rochester children are now being studied to determine whether lead prevents them from attaining peak bone density.

Fortunately, encephalopathy and death from lead poisoning is now rare. However, the recent death of a Manchester child underscores the need for continued vigilance. In addition, the dangers of asymptomatic lead poisoning in children are becoming increasingly apparent. Longitudinal studies indicate that irreversible cognitive damage can occur with blood lead levels lower than those typically associated with explicit symptoms and possibly lower than a blood lead level of 10 ug/dl. A recent study indicates that treatment with succimer, (an oral agent used for chelation therapy for youngsters with elevated blood lead levels) lowered blood lead levels, but did not improve scores on tests of cognition, behavior, or neuropsychological function in children with blood lead levels below 45 ug/dl. The study suggests that the lead burden within the body and the neurocognitive effects of elevated blood lead levels are irreversible (Source: New England Journal of Medicine, May 2001). The study reiterates the need for unified and concerted endeavors to promote the primary prevention of lead poisoning.

Core Public Health Functions

Public health infrastructure is the underpinning that supports the planning, delivery, and evaluation of public health practices (Centers for Disease Control and Prevention, 1998). The core functions of public health are inherent within the strategies implemented by state and local public health to promote the prevention of lead poisoning.

The core public health functions for local public health as defined by the Institute of Medicine in *The Future of Public Health* in 1988, are outlined below:

- **Assessment, monitoring and surveillance** of local health problems, needs and the resources for dealing with them;

- **Policy development and leadership** that foster local involvement and a sense of ownership, emphasizes local needs and advocate equitable distribution of public resources and complimentary private activities commensurate with community needs; and
- **Assurance** that high-quality services, including personal health services, needed for the protection of public health in the community are available and accessible to all persons; the community receives proper consideration in the allocation of federal and state as well as local resources for public health; the community is informed about how to obtain public health, including personal health services, or how to comply with public health requirements.

The report also recommended that the public health duties of state governments include the following:

- Assessment of health needs in the state based on statewide data collection;
- Assurance of an adequate statutory base for health activities in the state;
- Establishment of statewide health objectives, delegating power to localities as appropriate and holding them accountable;
- Assurance of an appropriate organized statewide effort to develop and maintain essential personal, educational, and environmental health services; provision of access to necessary services; and solution or problems inimical to health;
- Guarantee of a minimum set of essential health services; and
- Support of local service capacity, especially when disparities in local ability to raise revenue and/or administer programs require subsidies, technical assistance or direct action by the state to achieve adequate service levels.

During the past century, public health has faces numerous challenges and has made much progress. Immunization, antibiotics, fortified foods and clean water are just a few of the public health advances of the 20th century that have extended life expectancy from 45 years at the turn of the century to more than 75 years today. However, it is sobering to conclude in 2002 that youngsters continue to be exposed to lead at unacceptable levels. The Centers for Disease Control and Prevention have identified at least ten public health challenges in the decades ahead. Inclusive within the top ten challenges are the institution of a rational health care system, the elimination of health disparities, a focus on children's emotional and intellectual development and cleaning up and protecting the environment (JAMA, 2000). Collectively, these specific topics represent many of the challenges represented in the battle against lead poisoning.

In 1992, the New Hampshire Department of Health and Human Services received a grant from the CDC to expand its Childhood Lead Poisoning Prevention Program activities throughout the state. The New Hampshire Childhood Lead Poisoning Prevention Program (NH CLPPP) has six core activities: case management, environmental assessment, licensing and certification of lead paint professionals, surveillance, professional and public education and policy development. The NH CLPPP collaborates with federal and local agencies, including the MHD to provide support for local programs.

Since 1993, the MHD has received funding from the NH CLPPP to implement a case management program for youngsters with elevated blood lead levels. The overall objective of case management is to ensure that any child with an elevated screening or confirmed blood lead test result receives appropriate, comprehensive, and coordinated medical and environmental follow-up, resulting in a decreased blood lead level. Elevated blood lead levels in children less than 72 months of age are reportable to the NH CLPPP. Data pertaining to children residing within the City of Manchester are routed from the NH CLPPP to the MHD for the implementation of case management. Case management activities commence when the MHD receives a report of a child (less than 72 months of age) with an elevated blood lead level of 10 ug/dl or greater. Child Health Services provides case management services for their clients with elevated blood lead levels. The NH CLPPP reports cases of elevated blood lead levels directly to Child Health Services. Educational materials are provided to parents of all children identified with a venous blood lead level of 10 ug/dl or greater. Referrals are also made to The Way Home. A child becomes a

case and receives ongoing comprehensive case management when he or she has a confirmed blood lead level of 15 ug/dl or greater. The nurse case manager contacts the child's health care provider to advise that venous confirmatory testing (diagnostic testing) be done within the recommended time frame. The nurse case manager ensures that the health care provider is aware of the recommended medical protocols and of the availability of the NH CLPPP's medical consultants. The NH CLPPP provides education for parents on methodologies to reduce lead exposure by telephone. In the City of Manchester, the nurse case manager provides home visits. Educational materials are provided in a culturally and linguistically appropriate manner. Case management is provided until the child's blood lead level is no longer elevated or until the child is discharged from the case management program for other reasons (e.g., moved to another community, lost to follow-up, parent refuses case management services).

The NH CLPPP environmentalists perform environmental assessments throughout the State. An investigation commences when a child is diagnosed with a blood lead level of 20 ug/dl or greater, with the nurse case manager providing a referral to the NH CLPPP. The nurse case manager collaborates with the NH CLPPP and the health care provider to ensure the coordination of environmental and medical follow-up. The NH CLPPP recommends methodologies for lead hazard reduction if the child is living in a privately owned home. If the child is residing within a rental unit and lead exposure hazards are found within the home, the NH CLPPP is authorized to issue an Order of Lead Hazard Reduction to the property owner under New Hampshire RSA 130-A if the child is determined to have a confirmed blood lead level of 20 ug/dl or greater. This order requires a property owner to initiate steps to ensure the property is lead-safe (NH Childhood Lead Poisoning Screening and Management Guidelines, 1998). According to the NH Code of Administrative Rules He-P 1602.33 "lead hazard reduction" means controlling lead exposure hazards through abatement, interim controls or a combination of the two measures. According to the New Hampshire Code of Administrative Rules He-P 1602.32 "lead free" indicates a full inspection has determined that a dwelling, dwelling unit, or childcare facility does not contain any lead-based substances. According to the New Hampshire Code of Administrative Rules He-P1602.34 "lead safe" indicates a licensed risk assessor has determined that lead exposure hazards are not present in a given dwelling, dwelling unit, or child care facility.

Since July 1, 1994, New Hampshire has had a mandatory reporting requirement for laboratories to report the results of all blood lead tests (elevated and non-elevated) performed. The main purpose of collecting all blood lead testing data is to permit the calculation of the rate of elevated blood lead tests. When statistically valid, the prevalence of elevated blood lead levels provides a valid basis upon which to make community-wide risk designations and more effectively target prevention strategies. The data surveillance system enables the NH CLPPP to provide descriptive data about screening practices in the State of NH that are ultimately contributed to the CDC database. This aids CDC in assessing the progress being made toward the elimination of childhood lead poisoning (Source: New Hampshire Childhood Lead Poisoning Screening and Management Guidelines, 1998).

The NH CLPPP and the MHD provides educational initiatives to a wide array of audiences to promote the primary and secondary prevention of lead poisoning. Key groups include health care providers, families, childcare providers, property owners and other community-based organizations. In addition to providing resources and support, the MHD also works to promote linkages to health care through its community outreach efforts.

Also consistent with the core functions of local public health is the leadership that the MHD provides for the Greater Manchester Partners Against Lead Poisoning (GMPALP).

Community Collaboration to Promote Lead Poisoning Prevention

In order to effectively promote lead poisoning prevention within the community, public health strategies are enhanced by the participation of a number of community collaborators. In addition to the Manchester Health Department, other local agencies involved with lead poisoning prevention include the following:

Healthy Home Services (The Way Home)

Healthy Home Services (HHS) uses peer educators from the community being to conduct home visits, collect dust samples, perform visual assessments, provide lead-dust reduction cleaning, education, training, and supplies to reduce lead exposure. HHS has hired a full-time lead abatement contractor who combines technical skill with a commitment to actualizing healthier lives for Manchester children. HHS facilitates cooperation in landlord/tenant situations in which fear of litigation or eviction could be a barrier to protecting the health of a child. HHS provides consultation to property owners with a licensed lead abatement contractor for a fee. In addition, staff is available to assist property owners to make repairs to reduce the potential lead hazards for a fee.

The Way Home has opened the Housing Resource Center at 214 Spruce St. The facility has six lead-safe units available to homeless families with children, with priority given to children with elevated blood lead levels and families who need to relocate while lead hazard work is being done.

Manchester Building Department

The Manchester Building Department enforces housing standards and provides "*Keep it Clean*" brochures to property owners who have questions regarding lead safe renovations.

Manchester Property Owners Association

The Manchester Property Owner's Association provides education for its members regarding methodologies on lead hazard reduction and provides community support for lead poisoning prevention initiatives. A representative from the Manchester Property's Owners Association sits on the Greater Manchester Partners against Lead Poisoning Coalition.

Southern NH Services

Southern NH Services distributes HUD funds through the NH Housing Finance Authority to perform lead-based hazard reduction.

St. Mary's Bank Loan Program

St. Mary's Bank is continuing a loan program to assist property owners in completing lead-safe interim control renovations. In addition, loans are provided to property owners to supplement funds received through the Lead-Based Paint Hazard Control Project through Southern NH Services.

Greater Manchester Partners Against Lead Poisoning (GMPALP)

The Greater Manchester Partners against Lead Poisoning (GMPALP) brings together an energetic and diverse membership to address the issue of lead poisoning. The goals of the coalition as outlined in the by-laws are listed below. These goals are consistent with the actions required to eliminate lead poisoning by the year 2010.

- Educate the community about lead poisoning, lead screening, and the recognition of lead hazards, and lead poisoning prevention (e.g., members of GMPALP have worked collaboratively to provide presentations to an array of audiences; education is provided at health fairs and health promotion events)
- Increase screening for at-risk children and improve follow-up for children with elevated lead levels (e.g., screening recommendations and updated screening data are disseminated to

GMPALP; members of GMPALP provide education to public and professional groups on the importance of universal screening)

- Assess the housing stock for lead hazards and increase the availability of lead safe and lead-free housing for all income levels (GMPALP members are provided with data regarding housing stock; GMPALP has provided input into the coordinated city plan to improve the housing stock; members have provided support for initiatives such as the HUD Healthy Homes and Lead Hazard Control Program application)
- Gain support for lead poisoning prevention initiatives from all factions of the community, including, but not limited to, representatives from minority groups, businesses, private citizens, medical, and social service agencies

Inherent in the mission of GMPALP was the need for the community action plan, to identify the issues, goals, strategies, and action steps necessary to comprehensively address lead poisoning prevention within Manchester. The plan provides a broad overview of the risk factors that may contribute to childhood lead poisoning and includes recommendations for the community to steer lead poisoning prevention initiatives.

Preventing Lead Poisoning: Model Programs Within Other Communities

Boston, Massachusetts

The Boston Health Department provides case management for children with blood lead levels >= 15 ug/dl and works with the Lead Action Collaborative to coordinate prevention initiatives within their community. Professional staff, a social worker, and community health workers implement a broad-based outreach campaign to public and professional groups. In addition, the City of Boston implements a HUD Healthy Homes Grant to promote primary prevention. Since 1991, a reduction in the number of elevated blood lead levels were reported; however, no specific outcome measurement was available.

Harris County, Texas

Tim Digman, MPH, Epidemiologist at the Centers for Disease Control and Prevention recommended the Harris County, Texas Lead Poisoning Prevention Program as a model program. The program commenced in 1998-99. The program provides lead screenings at WIC and the Head Start Program utilizing the LeadCare system. Approximately 100 lead screenings are provided each week. Approximately 4% of the children screened have elevated blood lead levels $\geq$ 10 ug/dl. Care coordination is provided for children with blood lead levels $\geq$ 10 ug/dl. Due to the critical nursing shortage in the area, they have created positions for Community Service Aides to replace their translator positions. The Community Services Aide provides capillary blood lead screening, education and translation services. As a relatively new program, no other data was available regarding the outcome of their strategies.

Milwaukee, Wisconsin

Dr. Alan Bloch, former Chief of the Lead Poisoning Prevention Branch at the CDC recommended the Milwaukee, Wisconsin Health Department as the ultimate model Childhood Lead Poisoning Prevention Program. The historical milestones of the Milwaukee, Wisconsin Childhood Lead Poisoning Prevention Program commenced in 1991 with a door-to-door screening initiative, whereby it was determined that 80% of children tested had lead levels >=15 ug/dl. The subsequent physician outreach program led to a 600% increase in screening rates within a two-year period. In 1992, the LeadWorks Program commenced with funding of $1.8 million dollars. This was a mayoral initiative to increase inspections, partially subsidize abatement, and create jobs. The Petit Foundation Donation of $300,000 also subsidized

abatements. The Milwaukee Health Department has also received consistent HUD funding for primary prevention. In 1993, following a number of the aforementioned activities as well as collaboration with EPA, a 25% decrease in blood lead levels was documented in Milwaukee after in-home education.

In Milwaukee the first intensive primary prevention initiative occurred in 1995 with the EPA/Land Demonstration Project. The project targeted lead hazard reduction activities and community education in a high-risk neighborhood. It was determined that both incentives and enforcement were needed, along with a clear housing standard and a community demand for lead-safe housing. In 1996 the *Milwaukee Lead Report* was published as a newsletter for physicians that is released four times per year. In 1997, a low-cost window treatment program was developed ($135.00 per window). Also, the Community Capacity Project commenced with a mission to build community value through lead-safe housing and developed neighborhood based solutions by community residents to address childhood lead poisoning prevention. The Milwaukee Community Capacity Project has contractual relationships with four community-based organizations. Resident leadership groups design projects and influence decisions to increase lead-safe availability in each specific neighborhood.

Currently, the Milwaukee Health Department receives $4-5 million dollars per year through several funding sources including HUD Healthy Homes for primary prevention and City funds. The Department provides screening, data management, care coordination, and enforcement activities supported by 12 inspectors. The Department subsidizes property owners who implement primary prevention. Case management is initiated at blood lead levels of 15 ug/dl or greater by a Case Management Team consisting of a Public Health Nurse and a Public Health Aide. An Environmental Health Specialist and the Public Health Nurse Coordinators support these individuals. Since 1994, newly identified cases of lead poisoning decreased by 73% in Milwaukee (from 6,727 cases in 1994 to 1,819 cases in 1999). The number of chelations decreased by 27% since 1994 (from 108 in 1994 to 79 in 1999).

Since 1992, the Milwaukee Childhood Lead Poisoning Prevention Program has partnered with the Centers for Disease Control and Prevention, the National Center for Lead Safe Housing, the Environmental Protection Agency, the Nonprofit Center of Milwaukee and the University of Wisconsin School of Preventive Medicine to conduct multiple research and evaluation projects. A retrospective examination of in-home educational visits to reduce childhood lead levels and lead hazard reduction techniques was done in 1995. The study identified an average decrease in blood lead levels (n=187) of 4.2 ug/dl, or by about 21%. A decline of 1.2 ug/dl (6%) was identified in a reference group of 236 children who did not receive an in-home visit due to non-responsiveness or families who were “lost to follow-up”. In the lead hazard reduction study, the average pre-abatement blood lead level was 34 ug/dl and decreased to an average post-abatement blood lead level of 26 ug/dl, a 24% decline.

The Milwaukee Prospective Educational Intervention Study commenced in 1996. The objective of the study was to evaluate the effectiveness of public health worker educational visits in the homes of children with BLL’s 20-24 ug/dl. The homes were monitored for various lead levels in dust, water and soil and families received educational interventions. Follow-up measures included examinations of the environment and the tracking of blood lead levels as the main measure of effectiveness. Blood lead levels declined, on average, 5.1 ug/dl approximately two months after the intervention. A reference group of children not receiving the educational visit due to non-responsiveness or families who were “lost to follow-up” was also studied. The study group had a decline in BLL’s 5 ug/dl greater than the reference group receiving no educational home visit. The study concluded that although elevated blood lead levels remained in most of the children studied, important reductions occurred with this relatively inexpensive ($100.00 per visit) and simple educational intervention.

In 1999, the Milwaukee Health Department conducted a prospective study of the effectiveness of low-cost household paint abatement to reduce blood lead levels in children. The homes of 37 children between the ages of 6 months to 7 years were enrolled in the study. The Health Department provided environmental inspection, abatement and nurse case management services. The mean decline of BLL"s was 7.2 ug/dl.

Detroit, Michigan

Detroit, Michigan developed the WIC –Lead Testing connection. Lead screenings are provided for WIC-enrolled youngsters, with Community Health Assistants being trained to provide the fingersticks. In 2001, 2,507 children were tested. Overall, the city-screening rate for children six years of age and under has increased by 13%. Screening rates for one and two-year-old children have increased from 29% to 38%.

Chicago, Illinois

In 2001, the Centers for Disease Control and Prevention developed the High-Intensity Targeted Screening (HITS) to improve the nation's ability to target and screen children for lead poisoning and prevent exposure to lead. HITS consists of the following components:

- **Door-to-Door Screening**: Teams of staffers from local childhood lead poisoning prevention programs and community members, assisted by CDC, visit home in high-risk communities to screen children for lead.
- **Intervention:** When children are found to have elevated BLL's, the families are offered appropriate medical treatment and a home assessment for lead.
- **Capacity Building:** Local programs will use HITS data to improve lead screening plans, better direct resources, increase technical capacity and monitor progress toward the elimination of lead poisoning.
- **Partnership Building:** The HITS approach requires partnerships to be developed between community members and multiple federal, state and local agencies, resulting in a more comprehensive approach to eliminating childhood lead poisoning at the local level.

In November, 2001, the first HITS project in two inner-city communities in Chicago was completed. Blood samples were collected from 580 children 12 to 71 months of age. Preliminary analyses indicate that approximately 30% of the children have elevated blood lead levels. Data analysis is ongoing. The total cost of the project is estimated at $62,000.

Philadelphia, Pennsylvania

Lead Awareness: North Philly Style is a four year community project implemented by the Philadelphia Housing Authority, the Village of the Arts and Humanities (an organization devoted to introducing the arts and humanities to all socioeconomic groups), the Philadelphia Parent Child Center, the Neighborhood Action Bureau and the Salvation Army. Four experimental and one control census tracts were selected and matched on the basis of the percentage of housing built before 1950, the percentage of the population living below poverty level and the percentage of African-Americans. The prevention/intervention strategies were developed by and for this economically disadvantaged urban African-American population.

Creative, interactive educational sessions, including puppet shows, crafts and chants were presented to children in after school and camp programs. Thirty interactive sessions were held each year. Each program included an attendance of forty children. Each year thirty block parties were held for adults with an average attendance of thirty. Adults received a standardized curriculum addressing risk as an environmental agent. The adults received incentives which included materials needed to limit lead exposure, as well at t-shirts, tote bags and lanyards to hold keys. The shirts and totes were emblazoned with the slogan, *Lead Awareness*: *North Philly Style.* A chant used in the school/camp programs included, *"Wash those hands, wipe those feet, don't bring that lead from off the street"*.

Pictorial pre-tests given to the adults before the curriculum was presented made all participants aware of their need for knowledge. To test the impact of the prevention/intervention strategies on knowledge related to the risk of lead, random phone surveys were completed before the intervention strategies began and after the first and second years of the interventions. During the first year of the study, adults in the experimental census tracts tested and reported on lead exposure in their homes using lead-sensitive brushes distributed at the informational block parties. To test for exposure and outcome surveillance, the percentage change in the BLL's of children (ages 1-6 years and younger) living in the experimental and control groups was followed. After the first year of the intervention, there was a 27% increase in the number of children tested in the experimental group, as compared to a 10% increase in the control census tract. After the initial year of the intervention, there was a 3% decrease in the percentage of children with venous BLL >= 10 ug/dl in the control census tract, as compared with an 11% decrease in the experimental census tracts. At the end of three years of interventions, there was a 24% decrease in venous BLL >14 ug/dl in the control census tracts, versus a 27% reduction in the experimental census tract. In terms of outcome surveillance, there was a larger percentage reduction in venous BLL > 19 ug/dl, 24 ug/dl and 29 ug/dl in the experimental census tracts than in the control census tracts. Over the three years of the interventions, the largest difference or percentage change in venous BLL between the experimental and control census tracts was a 5% greater reduction in the number of children with levels > 29 ug/dl. At the end of the three-year intervention there were no children in the experimental census tracts with BLL over 29 ug/dl, unlike the control census tracts (Source: American Journal of Public Health, May 2002).

The Determinants of Lead Poisoning

"*If we are to prevent the extensive damage lead causes, we cannot wait for symptoms to alert us to the presence of lead in a child's environment. We must search the environment for sources of lead and get rid of it in safe ways. Removing lead paint from all our housing would go a long way toward that goal. It would require a gigantic effort and cost billions of dollars — it's all a matter of priorities.*"

-Herbert Needleman, MD

Risk Factors and Pathways of Lead Exposure

In 1998, the NH Department of Health and Human Services Childhood Lead Poisoning Prevention Program declared the City of Manchester a high-risk community for lead poisoning. Living in an older home is the leading risk factor for children being exposed to lead. The City of Manchester has an abundance of older housing stock, particularly in the densely populated center city. Over 80% of dwellings in six center city tracts (4, 5, 13, 14, 15 and 20) were built prior to 1940 (Manchester Health Department). Approximately 38% (17,000) of the 44,361 units within the City of Manchester as a whole were built prior to 1940. Forty-six per cent (46%) of Manchester housing units were built before 1950, which involves more than 20,000 units (1990 Census Data). The Centers for Disease Control and Prevention (CDC) established the criteria for high-risk designation as 27%. *Attachment A* depicts childhood lead poisoning and occupied housing units built prior to 1950. *Attachment A-1* depicts childhood lead poisoning in occupied housing units built prior to 1980.

Poverty is also a significant risk factor for lead poisoning as families with low income are more likely to live in substandard older housing and may have less access to health care. In addition, children from low-income families are less likely to have a diet rich in iron and other nutrients. Low-income youngsters enrolled in Medicaid were more than three times as likely to have high blood lead levels as compared to children not receiving care under the Medicaid program. There is a subset of the Medicaid population that may not access health care and subsequently may not receive screening. Based on this link to poverty, the Centers for Disease Control and Prevention recommends that all children enrolled in Medicaid or other income-based assistance program be considered high-risk for lead poisoning (New Hampshire Childhood Lead Poisoning Screening and Management Guidelines, 1998). Manchester children are almost twice as likely to live in poverty than the other children in the State of New Hampshire (12.2% vs. 7.0%). Children residing in center city dwellings, are five times more likely to live in poverty compared to all New Hampshire children (35.0% vs. 7.0%) (Greater Manchester Area Community Needs Assessment, 1997). According to the 1990 Census Data there were 2,795 persons younger than 18 years of age, living below poverty in the City of Manchester. This represents 12.6% of the 22,180 persons under 18 for whom poverty status is determined. In addition, an even greater number of families are living below 200% of poverty (defined as an income twice the "living below poverty" threshold), who are often referred to as the "working poor". Parents or legal guardians may work several jobs or may be unable to take leave away from work to bring children for well-child visits or preventive health services, as they may not receive monetary compensation for such time away from their jobs.

In addition to residing in older housing with leaded paint and contaminated dust, children may be exposed to lead through many other sources, including the following:

- Contaminated dust and/or soil
- Improper renovations and remodeling
- Drinking water contaminated by pipes lined or soldered with lead
- Exposure to lead dust from occupations or hobbies

- Exposure to improperly fired ceramics, leaded crystal, lead-soldered cans, imported or antique pottery
- Home remedies and/or cosmetics used in some cultures
- Other sources: some vinyl miniblinds, lead sinkers, ammunition, stained glass, burning lead, painted wood

Housing Needs and Problems

Homelessness continues to increase in the City of Manchester. In March, 2002, Manchester's service providers identified 1,635 homeless families in a one-day count. While some stay at homeless shelters and transitional housing facilities, others become the invisible homeless, illegally sharing another renter's apartment, usually in unsafe or crowded conditions. The current housing shortage has exacerbated the challenges in securing affordable, lead-safe housing for families in high-risk situations. The Way Home staff reports that some families remain in homeless and/or hazardous conditions for more than a year.

The Way Home had calls from 87 homeless families with children under the age of six during the nine-month period of July 2001 through March 2002. In its 2000 Consolidated Plan, the City of Manchester defined households with housing needs as those having any of the following problems: overcrowding, excessive cost burden, physical inadequacy of the housing. The report estimated that 40% of renters have at least one of the housing need indicators. The highest incidence of problems were among the extremely low and very low-income households.

It is challenging for low-income families to compete for housing with higher income households. Manchester shares in the housing crisis that is compounded by a statewide income gap. Stagnant wages for the half of households below median income and rising housing costs for both renters and homeowners are exacerbating the housing predicament. In the last ten years, the average real income of the bottom fifth (the 20% with the lowest comparative income) of families actually fell 14.1%. The *Wages and Housing Report defined* the "housing wage" as the minimum income a household needs to be able to afford rental housing. The report identified that only six occupations out of the twenty expected to add the most new jobs, paid the minimum hourly housing wage. Housing for many workers will continue to be unaffordable. The availability of housing depends on both income and rental cost.

Median Monthly 2-Bedroom Rental Cost	Annual Rental Cost	Annual Housing Income	Hourly Housing Wage
$774.00	$9,288.00	$30,960.00	$14.88

Screening in the City of Manchester

In December 1998, the New Hampshire Department of Health and Human Services Childhood Lead Poisoning Prevention Program issued the *New Hampshire Childhood Lead Poisoning Screening and Management Guidelines.* Based on recommendations from the Centers for Disease Control and Prevention, the strategies are designed to increase screening of children living in high-risk communities and to decrease unnecessary screening of children residing in low-risk communities. CDC's recommended cut-off for a high-risk community is 27% pre-1950 housing, based on 1990 Census data. In New Hampshire, communities with 27% or more housing built before 1950 are considered high-risk. Thus, the City of Manchester is designated as a high-risk community, with the recommendation that a universal screening approach be implemented whereby all one and two year old children are tested. In

addition, the NH CLPPP recommended that children at 36 to 72 months of age be tested, if not previously screened. Since 1996 screening rates for one year old children decreased by nearly 20% in Manchester (from 80% in 1996 to 63.23% in 2000) (NH Department of Health and Human Services Childhood Lead Poisoning Prevention Program). This decrease may be partially attributable to the cessation of childhood lead screening at WIC Clinics when funding was no longer available.

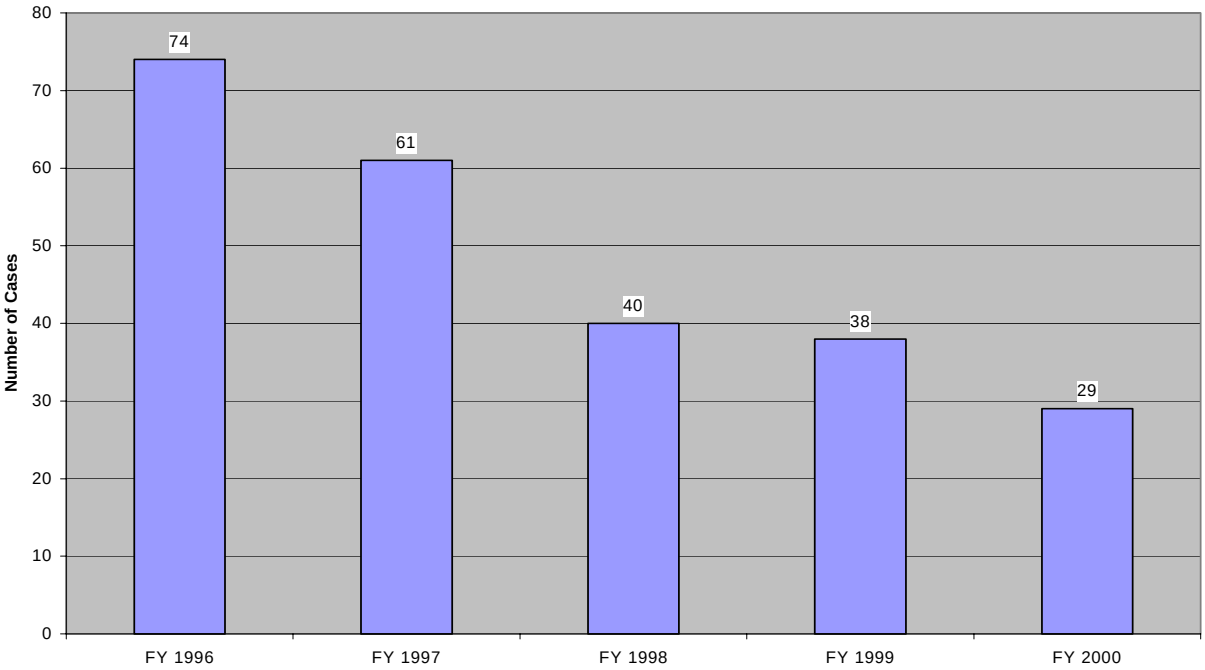
City of Manchester Screening Rates
1996-2000

Year	% of One-Year-Old Children Screened	% of Two-Year-Old Children Screened
1996	**80%**	**29%**
1997	**86%**	**27%**
1998	**72.4%**	**25.96%**
1999	**61.56%**	**27.94%**
2000	**63.23%**	**32.39%**

Elevated Blood Lead Levels in Manchester

Since 1996, 242 Manchester children have been identified with elevated blood lead levels of 15 ug/dl or greater. In 2000, there were more than 160 Manchester children with elevated blood lead levels in active case management at the Manchester Health Department and Child Health Services. During 2000, 125 Manchester children were determined to have elevated blood lead levels $\geq$ 10 ug/dl. In the State of New Manchester Hampshire, 465 youngsters were tested in 2000 with elevated blood lead levels $\geq$ 10 ug /dl. Twenty-seven per cent of the newly identified cases are from the City of Manchester, while the population in Manchester represents only 9% of the State's total population (NH Department of Health and Human Services Childhood Lead Poisoning Prevention Program). The following graph represents newly identified elevated blood lead levels 15 ug/dl or greater since 1996. It is remarkable to note that screening rates also decreased during this period of time.

Elevated Blood Lead Levels (15 ug/dl and greater), 1996-2000



Potential Risk Factors among Children Enrolled in WIC Program

Women, Infants and Children (WIC) is a federally supported supplemental food program for income-eligible pregnant women, breastfeeding women, and infants. Inclusive within the program is the provision of healthy food choices, counseling on nutrition, preventive services and referrals for health care.

In 2000, 11.0 % of the 1,571 children participating in Manchester WIC Clinics were classified as having iron deficiency. Chronic iron deficiency in childhood may have an adverse impact on growth and development. Iron deficiency may also enhance lead absorption and toxicity, and often co-exists with it. In addition, as the program serves an income-eligible population, many families may be likely to reside in older, substandard housing which may also place them at increased risk for lead exposure.

For many years, the Manchester Health Department provided lead screenings at WIC Clinics, which were held on-site at the Manchester Health Department. Funding from the NH Childhood Lead Poisoning Prevention Program allowed for a Community Health Nurse to provide lead screenings for children during WIC Clinic hours. During 1997-98 the funding to provide lead screenings at WIC ceased. Through a series of meetings with the Manchester Health Department and WIC representatives, it was determined that the vast majority of WIC-enrolled youngsters were linked with a health care provider. Ideally, children who have access to health care should receive lead screenings at their medical home.

Children Participating in WIC from Manchester Who Were Determined to Have Iron Deficiency 2000

Child's Age	Children Participating in WIC	Children with Hemoglobin < 11.0	% of Iron Deficient Children in WIC
1 Year Olds	454	88	19%
2 Year Olds	355	42	12%
3 Year Olds	360	29	8%
4 Year Olds	402	19	5%
Total	1,571	178	11%

With the cessation of lead screenings at WIC Clinics, Health Department representatives provided presentations to the local medical community and GMPALP to assure the implementation of universal screening recommendations. Although health care providers were provided with the recommendations and were eager to increase lead-screening initiatives, subsequent data indicated a drop in lead screening rates from 80% in 1996 to 63.23% for one-year-old children in 2000. Families enrolled in WIC may encounter barriers to accessing preventive health care. In addition to transportation, financial and cultural/language barriers, some families may be employed within positions which do not provide benefits or monetary compensation for time lost at work. Some families may be reluctant to take time away from their jobs for well-child visits, the time when most lead screenings are done. On the other hand, families attending WIC Clinics receive incentives for participation (i.e., vouchers for food supplements); hence, they are a captive audience for promoting lead screening and education on lead poisoning prevention.

Variables that Impact Access to Health Care

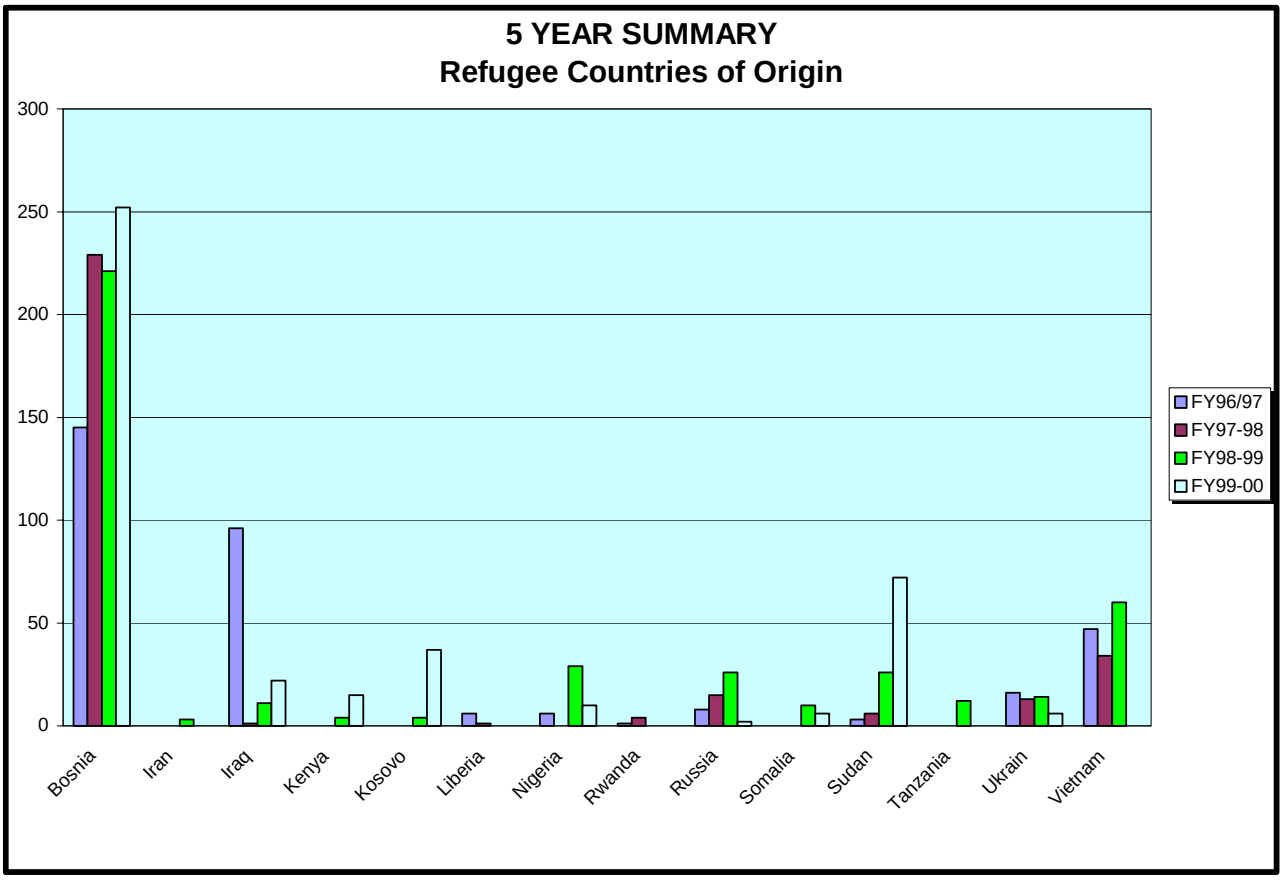
Recent data suggests that socioeconomic status related disparities in health status within the United States population have increased over the past decade. The disparities include a higher prevalence of life-style related risk factors for disease (e.g., tobacco use), lower rates of involvement in activities which promote health, a failure to use preventive health services and less access to health care. In addition, there a higher rates of illiteracy which make messages promoting health less accessible, as well as social stressors which can impact biological and psychosocial functioning (NIDR, 1997). Disparities in health status may persist even when barriers to health care are lessened by the implementation of low-cost or no-cost health insurance.

The Centers for Disease Control and Prevention identified the institution of a rational health care system as a top public health challenge for the next decade. The nation in need of a health care system that balances equity, cost and quality. The fact that 45 million Americans are uninsured, in many cases, despite being employed is just one indication that health care resources are unevenly distributed. Half of the deaths each year are from preventable causes, suggesting that the health care system has the potential to emphasize prevention as well as treatment (JAMA, 2000)

The New Hampshire Healthy Kids Program provides low cost or no cost health insurance for children, but families are still challenged with navigating systems which may be complicated or overwhelming for some individuals. As of 1997-98, there were 4,663 Manchester children enrolled in Medicaid. Although

the Healthy Kids Program has been a panacea for some, many families who have financial coverage for health care still encounter barriers to accessing the health care system.

Historically, the City of Manchester has had a heritage steeped in ethnic and cultural diversity. Recent shifts within the past decade have greatly impacted health care within the community and a family's ability to access the health care system. Barriers include language, transportation, financial issues, cultural influences and issues around trust. The City of Manchester is a major refugee resettlement area. Refugees are defined as persons who are outside their countries of origin, but not yet in the United States, who have a well-founded fear of persecution because of race, religion, nationality, political opinion or membership in a social group. The resettlement agencies include the International Institute of New Hampshire, Catholic Charities, and Lutheran Social Services. Since 1996, more than close to 2000 new arrivals have resettled within the community from countries of origin, which include Bosnia, Iraq, Kosovo, Nigeria, Russia, Sudan and the Ukraine. In addition, the Hispanic population also continues to grow. The 2000 Census Data reports that there are 4,944 Hispanic Americans residing within the City of Manchester, representing 4.6% of the population. Currently, seventy-two languages are spoken in Manchester schools.



Preventing and Managing Lead Poisoning

Lead Poisoning Prevention Strategies

The Greater Manchester Partners against Lead Poisoning commenced work on the development of a community action plan in 2001. Through the work of a committed Steering Committee, the group identified a number of issues that impact lead poisoning within the community. The issues are as follows:

- Unsafe leaded home environments are the major cause of lead poisoning. The scarcity of both lead free and lead safe affordable housing for families residing within the City of Manchester places young children at great risk for this serious, preventable health problem.
- The main stakeholders such as property owners, public health officials, health care providers, government agencies and parents may have conflicting information which may lead to polarized ("us vs. them") relationships.
- There continues to be misperceptions within the community that lead is not hazardous and is no longer a public health problem.
- Excellent guidelines exist for screening children for lead poisoning, but are not fully implemented by health care providers. In 2000, only 63% of one-year-old children and 32% of two-year-old children were screened for lead.
- Low screening rates may be partially related to funding cuts, which led to the cessation of lead screening during WIC Clinics.
- Social, cultural, financial, educational and other non-medical barriers exist that may limit access to and utilization of the health care system. The barriers may impede screening initiatives and optimal follow-up care for children with elevated blood lead levels.
- Children with elevated blood lead levels require ongoing care coordination to assure that the environmental, nutritional, hygienic and follow-up testing components of lead poisoning are addressed. During the year 2000, 33 Manchester children with newly identified elevated blood levels of $\geq$ 15 ug/dl received case management services. Additional 77 children with blood lead levels of 10-14 ug/dl may benefit from the expansion of case management services.

Keeping in mind the aforementioned issues, the Greater Manchester Partners Against Lead Poisoning developed Healthy Manchester 2010 objectives, goals, and recommended actions for the community to prevent lead poisoning.

Educate The Community

As a response to childhood lead poisoning within the community, the Greater Manchester Partners Against Lead Poisoning GMPALP was formed to link community stakeholders in the battle against lead poisoning. Comprised of a committed membership, GMPALP developed the following mission statement:

> *The Greater Manchester Partners Against Lead Poisoning is an open organization representing the Manchester community, including, but not limited to: private citizens, public health and private health care agencies, property owners, tenants, businesses and other agencies. This coalition has been established to comprehensively address and prevent lead poisoning in the children of Manchester.*

Through it's diverse membership, GMPALP will bring forth opportunities to provide community education to groups which may include, but not be limited to, the local medical community, parenting groups, child care agencies, property owners and elected officials.

GMPALP will also continue to involve the media in promoting lead poisoning prevention messages, which are culturally and linguistically sensitive.

- Maintain work with the local media in promoting prevention message through press releases, radio interviews and the Public Health Show.
- Continue the inclusion of lead poisoning prevention materials in newborn packets.
- Continue annual presentations for health care providers regarding screening data and the prevalence of lead poisoning within the community.
- Sustain and expand opportunities for presentations focusing on lead poisoning prevention for families, childcare providers and community-based agencies.

Future Opportunities

- Implement educational programs for adults and children with outcome measurements, modeled from *Lead Awareness: North Philly Style.*
- Develop simple handouts addressing lead poisoning prevention for the general public. The handouts will be available in several languages and will include information about agencies involved with lead poisoning prevention efforts.
- Present the recommendations of the Community Action Plan to local health coalitions, the medical community, community-based organizations and to members of the local, state and federal government who are the prime movers in making the decisions necessary to achieve the goal of the elimination of childhood lead poisoning.
- Link with faith communities to promote lead poisoning prevention efforts.
- Work with local academia in increasing the awareness of lead poisoning prevention among students pursuing a career within the health care arena.
- Collaborate with maternal and child health practitioners in encouraging the primary prevention of lead poisoning and optimal nutritional habits.
- Increase the awareness of existing research related to the effects of lead on children.
- Every pediatrician and health care provider serving families will receive a newsletter, on a bi-annual basis, similar to the *Milwaukee Lead Report* in Milwaukee, Wisconsin.
- Disseminate lead poisoning prevention messages on buses and city vehicles.

Increase Screening for At-Risk Children and Improve Follow-Up

Healthy Manchester 2010 Objective

- To achieve the goal of the elimination of childhood lead poisoning by 2010, one and two year old Manchester children will receive universal blood lead screening by 2005.

  Baseline: In 2000, 63.23% of one-year-old children and 32.39% of two-year-old Manchester children received screening

  Target: 100%

Healthy Manchester 2010 Objective

- Eliminate elevated blood lead levels (≥ 10 ug/dl) in all children.

  Baseline: 1.75% (125) of Manchester children aged 1 to 5 years of age were newly identified with blood lead levels exceeding 10 ug/dl during 2000.

  Target: Zero

- Continue to raise awareness for all community members, particularly health care providers and parents regarding the Centers for Disease Control and Prevention screening guidelines, which are consistent with Manchester's designation as a high-risk community.
- Provide annual presentations for health care providers on screening prevalence and recommendations.
- Promote the implementation of universal screening, particularly for children at one and two years of age within the City of Manchester through the continuation of screening initiatives at Manchester Health Department clinics, on the Neighborhood Public Health Van and at other outreach sites.
- Continue funding for the nurse case management programs at the Manchester Health Department and Child Health Services in order to provide coordination of the medical and environmental strategies for children with elevated blood lead levels, as well as in-home education.
- Continue to strengthen State and local surveillance efforts regarding screening practices and rates of elevated blood lead levels.
- Through linkages with the Shots by Two Program, continue to notify all new parents of universal lead screening recommendations at the child's first and second birthdays.
- Continue to provide and enhance educational initiatives on screening recommendations, current data and follow-up care to hospitals, health care providers and Emergency Departments.
- Strengthen and support the referral process to the New Hampshire Department of Health and Human Services Healthy Kids Program to facilitate access to health care.
- Utilize the LeadCare system to provide real-time blood screening at the Manchester Health Department and WIC Clinics; collaborate with the medical community to ensure appropriate follow-up for children with elevated blood lead levels.
- Maintain and strengthen referral networks between the Manchester Health Department, Manchester Community Health Center, Child Health Services and other health care providers to enhance access to health care.
-

Future Opportunities

- Work with NH CLPPP and CDC to develop a door-to-door screening initiative such as the HITS Program in Chicago and the door-to-door effort in Milwaukee in order to identify children at highest risk.
- Seek funding to expand lead screening at WIC Clinics. Explore the use of Community Health Assistants to provide screening as is done in Detroit, Michigan with the WIC-Lead Testing Program.
- Work with insurance providers and managed care organizations to ensure funding for screening is available.

- Local health care providers will work with their peers within the medical community to resolve barriers to screening; health care providers will be encouraged to designate one contact person per practice for follow-up on children with elevated blood lead levels.
- Develop "*Train the Trainer*" programs to increase screening and promote access to health care utilizing Community Health Workers and/or Community Health Aides, Public Health Translators and other community-based organizations such as the Minority Health Coalition who have the ability to access hard-to-reach populations.
- Provide incentives and provide for transportation costs for families accessing lead screenings.
- Develop and disseminate a resource manual and directory of support services related to lead poisoning prevention.
- Acquire funding to expand nurse case management services to children with blood lead levels $\geq$ 10 ug/dl.

Assess and Increase Lead-Safe Housing Stock for All Income Levels

Healthy Manchester 2010 Objective

- Increase the proportion of occupied rental units, which meet COC requirements.

  Baseline: Baseline Not Available

  Target: 100%
- Continue to provide input into the development of a coordinated city plan to improve the housing stock within the City of Manchester and evaluate the outcome.
- Sustain and enhance support for initiatives which promote healthy homes such as the HUD Healthy Homes and Lead Hazard Control Program Application and EPA grants, as well as the efforts of the Building Department, Housing Code, Neighborhood Housing, The Way Home and Southern NH Services.
- Continue to support The Way Home to ensure the availability of at least one lead-safe unit for families while renovations are being done.

Future Opportunities

- Work with city government, NH CLPPP and community-based agencies to implement initiatives similar to the LeadWorks Program and the Community Capacity Project in Milwaukee, which will increase environmental investigations and partially subsidize abatements. Develop neighborhood-based solutions by community residents to address lead poisoning prevention. Resident leadership groups design projects and influence decisions to increase lead-safe housing availability in specific neighborhoods.
- Increase the membership of the Greater Manchester Partners Against Lead Poisoning to include more property owners, HUD, the Manchester Planning Department, Manchester Housing and Redevelopment Authority, Housing Code, the Building Department, Manchester Community Resource Center, representatives from legal services and certified lead inspectors.
- Work with the Planning Department, Zoning Department and the Building Department to assure an adequate number of lead-safe housing units.
- Work with resettlement agencies and agencies serving minorities such as the International Institute of New Hampshire, Lutheran Social Services, Inner City Partners, Latin American Center,

Minority Health Coalition and faith communities to ensure safe and affordable housing opportunities; recruit representatives from the aforementioned agencies to participate in GMPALP.

- Work with elected officials to enable legislation for tax incentives for property owners who provide lead-safe housing.
- Work with local banks, businesses and community-based organizations to encourage low interest loans or other innovative funding mechanisms to make dwellings lead-safe.
- New Hampshire Housing Finance Authority (NHHFA) will work as a bonding agent for no interest or low interest loans for window replacement programs and explore the concept of NHHFA acting as the finance agent with The Way Home being the consultant on jobs to make dwellings lead-safe.
- Seek and apply for grant funding to promote primary prevention efforts within the community.
- All building inspectors will receive training on lead poisoning prevention and dust wipe samples.
- Increase awareness among the Building Inspectors regarding the enforcement of current codes.

Gain Community Support

GMALP is working to gain support from all community groups, including, but not limited to, representatives from minority groups, businesses, private citizens, and medical and social service agencies.

- Continue to routinely assess GMPALP membership and identify other stakeholder who should be present at the table.
- Maintain and augment efforts to promote lead poisoning prevention within the City of Manchester with other community, faith, business and civic organizations.

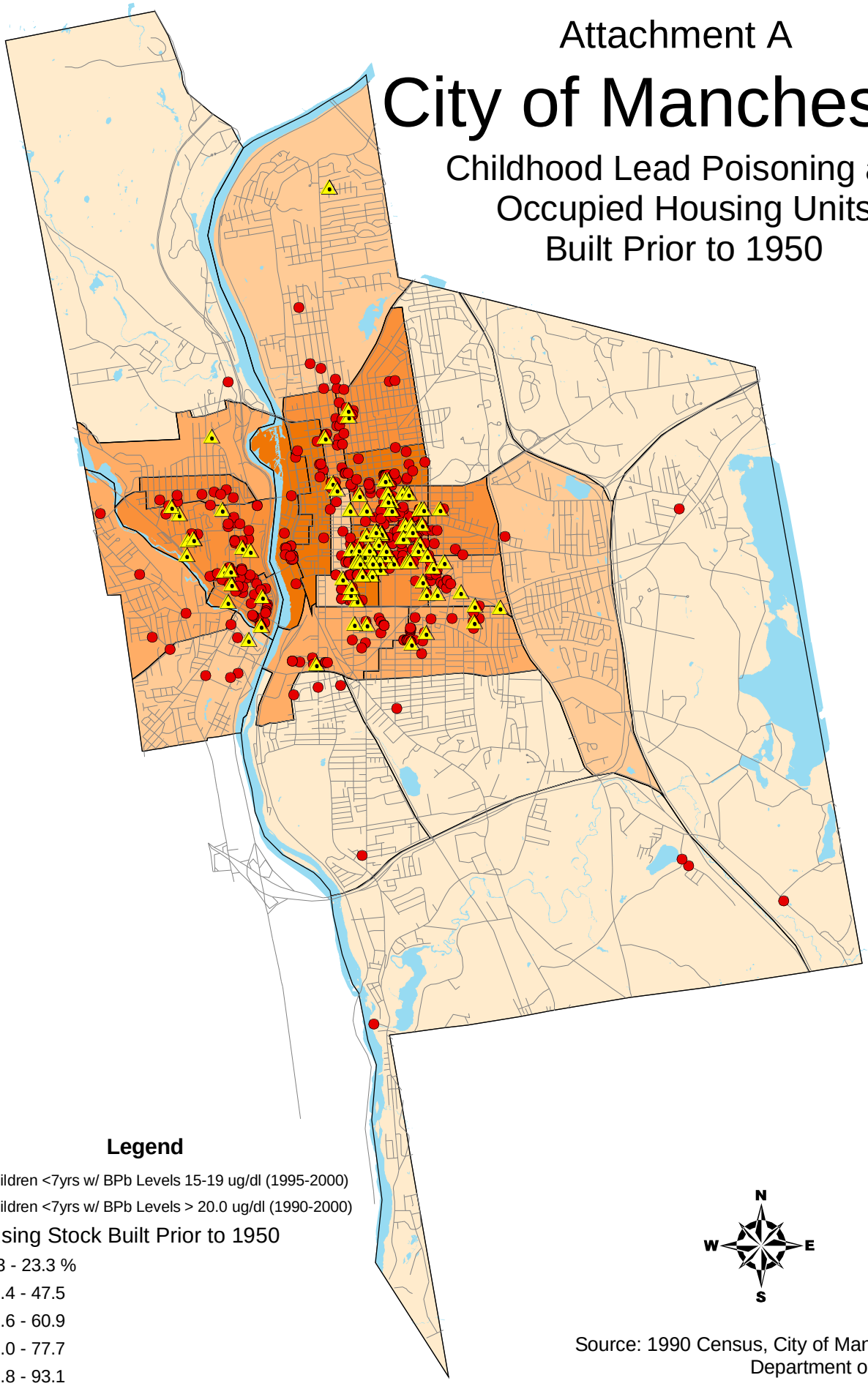
Future Opportunities

- Develop a brochure outlining the mission statement and overall goals of GMPALP, including recruitment information for wide distribution within the community.
- The Community Action Plan will be presented to a diverse audience within the community to promote awareness of lead poisoning prevention and gain support.
- Link with the Healthy Manchester Leadership Council, the Greater Manchester Asthma Alliance and the Manchester Immunization Group for Healthy Tots and Youth in promoting healthier lives for Manchester children. Explore the development of a "Healthy Kids" coalition, which will address asthma, lead, oral health and immunizations.
- Support the efforts of agencies serving minority populations in the development of a translator bank.

Attachment A

City of Manchester

Childhood Lead Poisoning and Occupied Housing Units Built Prior to 1950



Legend

- Children <7yrs w/ BPb Levels 15-19 ug/dl (1995-2000)
- Children <7yrs w/ BPb Levels > 20.0 ug/dl (1990-2000)

% Housing Stock Built Prior to 1950

- 3.3 - 23.3 %
- 23.4 - 47.5
- 47.6 - 60.9
- 61.0 - 77.7
- 77.8 - 93.1

N W E S

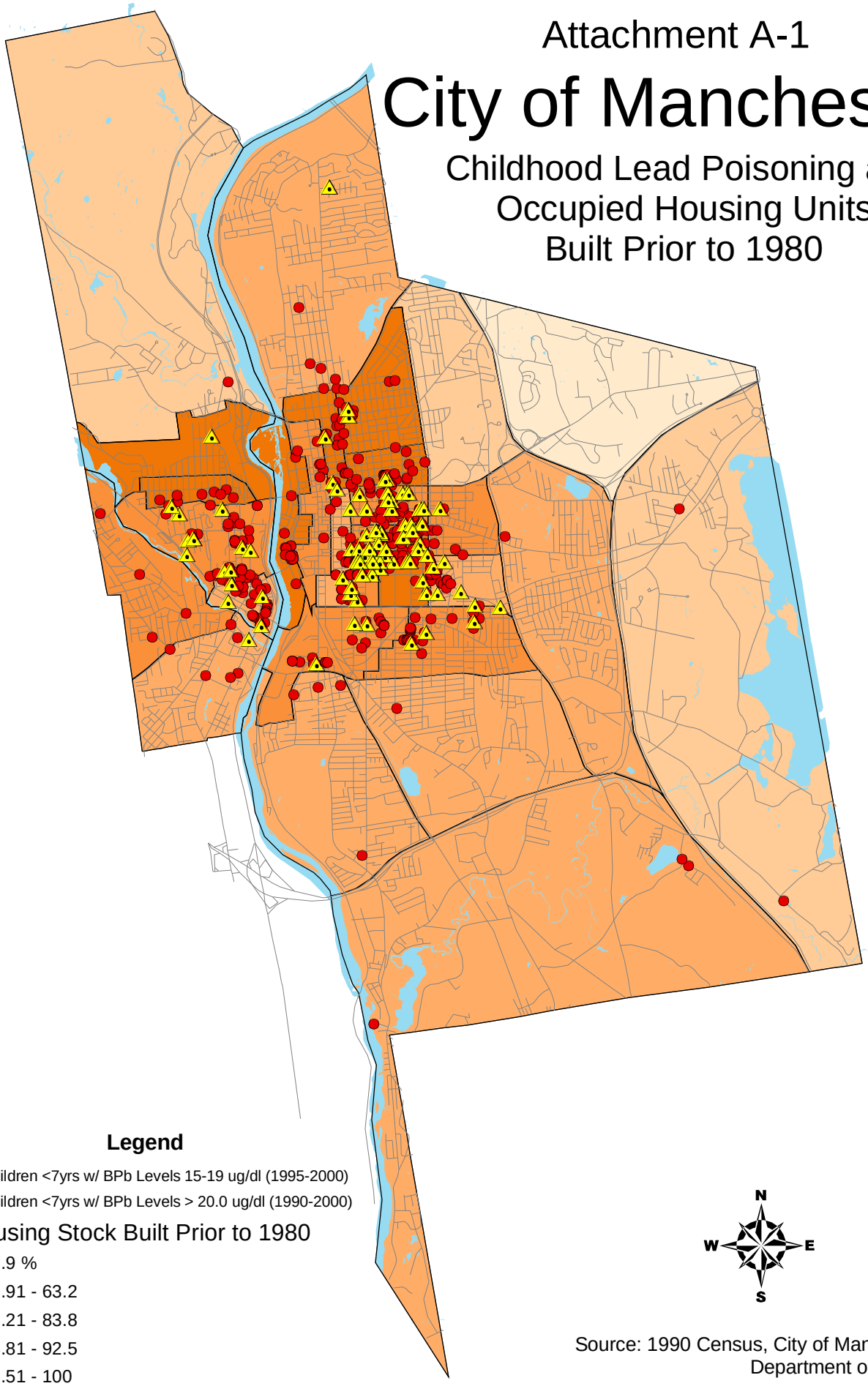
Source: 1990 Census, City of Manchester Department of Health

Prepared by: Aaron Krycki, BS, EHS

Attachment A-1

City of Manchester

Childhood Lead Poisoning and Occupied Housing Units Built Prior to 1980



Legend

- Children <7yrs w/ BPb Levels 15-19 ug/dl (1995-2000)
- Children <7yrs w/ BPb Levels > 20.0 ug/dl (1990-2000)

% Housing Stock Built Prior to 1980

- 12.9 %
- 12.91 - 63.2
- 63.21 - 83.8
- 83.81 - 92.5
- 92.51 - 100

N W E S

Source: 1990 Census, City of Manchester Department of Health

Prepared by: Aaron Krycki, BS, EHS

More Information

Additional Information on Lead Poisoning Prevention

Manchester Health Department
795 Elm Street, Suite 302
Manchester, NH 03101
(603) 624-6466 Ext. 315 or 335

New Hampshire Childhood Lead Poisoning Prevention Program
Office of Community and Public Health
NH Department of Health and Human Services
6 Hazen Drive
Concord, NH 03301
1-800-852-3345 Ext. 4719 or Ext. 4718

The Way Home
214 Spruce Street
Manchester, NH 03101
(603) 627-3491

Additional Copies Of This Report

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